

What is claimed is:

1. A three-dimensional image display apparatus, comprising:
 - an image display having a plurality of pixels arranged in an array, wherein the image display is configured to provide image light having a polarization;
 - a lens array arranged in front of the image display, configured to function as a lens for light having a first polarization direction, and not function as a lens for light having a polarization direction differing from the first polarization direction; and
 - a birefringent phase modulator placed between the image display and the lens array, wherein the birefringent phase modulator is configured to rotate a polarization plane of the image light.
2. The three-dimensional image display apparatus according to claim 1, wherein the birefringent phase modulator has a variable phase axis direction which is controlled by applied voltage.
3. The three-dimensional image display apparatus according to claim 1, wherein the birefringent phase modulator has a phase axis direction being variable on a portion of a screen of the image display.
4. The three-dimensional image display apparatus according to claim 1, wherein the birefringent phase modulator has phase axis directions differed on a screen of the image display.
5. The three-dimensional image display apparatus according to claim 1, wherein the lens array has a liquid crystal layer and a pair of electrodes which sandwich the liquid crystal layer, and controls a focal distance by applying a voltage between the pair of electrodes.
6. A three-dimensional image display apparatus comprising:
 - an image display having a plurality of pixels configured in an array, wherein the image display is configured to output an image light having polarization;
 - a lens array arranged in front of the image display, having a liquid crystal layer and a pair of electrodes which sandwich the liquid crystal layer, and configured to control a lens action for light having a first polarization direction by applying a voltage; and
 - a birefringent phase modulator arranged between the image display and the lens array and configured to rotate a polarization plane of the image light.
7. The three-dimensional image display apparatus according to claim 6, wherein one of the electrodes has a comb-like structure.
8. The three-dimensional image display apparatus according to claim 6, wherein the lens array configured to change a three-dimensional image display and a

two-dimensional image display by controlling the applied voltage according to a selection of a three-dimensional image and a two-dimensional image.

9. A three-dimensional image display apparatus comprising:

an image display configured to array a plurality of pixels and output an image light which has polarization;

a first lens array arranged in front of the image display, has a liquid crystal layer and a pair of electrodes which sandwich the liquid crystal layer, and configured to control a lens effect to light which has a first polarization direction by applied voltage;

a second lens array arranged in front of the first lens array, has a liquid crystal layer and a pair of electrodes which sandwich the liquid crystal layer, and configured to control a lens effect to light which has a second polarization direction differed from the first polarization direction by applied voltage;

a first birefringent phase modulator arranged between the image display and the first lens array and configured to rotate a polarization plane of the image light; and

a second birefringent phase modulator arranged between the first lens array and the second lens array and configured to rotate a polarization plane of the output light from the first lens array.

10. The three-dimensional image display apparatus according to claim 1, wherein the birefringent phase modulator has a liquid crystal layer and a pair of electrodes which sandwich the liquid crystal layer, and configured to control a phase-axis by a polarity of applied voltage to the electrodes.

11. The three-dimensional image display apparatus according to claim 6, wherein the birefringent phase modulator has a liquid crystal layer and a pair of electrodes which sandwich the liquid crystal layer, and configured to control a phase-axis by a polarity of applied voltage to the electrodes.

12. The three-dimensional image display apparatus according to claim 10, wherein the birefringent phase modulator configured to change a three-dimensional image display and a two-dimensional image display by controlling the phase-axis according to a selection of a three-dimensional image and a two-dimensional image.

13. The three-dimensional image display apparatus according to claim 11, wherein the birefringent phase modulator configured to change a three-dimensional image display and a two-dimensional image display by controlling the phase-axis according to a selection of a three-dimensional image and a two-dimensional image.

14. The three-dimensional image display apparatus according to claim 1, wherein the birefringent phase modulator has a liquid crystal layer and a pair of electrodes which sandwich the liquid crystal layer, and configured to control a

phase-axis by an applied voltage to the electrodes.

15. The three-dimensional image display apparatus according to claim 6, wherein the birefringent phase modulator has a liquid crystal layer and a pair of electrodes which sandwich the liquid crystal layer, and configured to control a phase-axis by an applied voltage to the electrodes.

16. The three-dimensional image display apparatus according to claim 14, wherein the birefringent phase modulator is configured to change a three-dimensional image display and a two-dimensional image display by controlling the applied voltage according to a selection of a three-dimensional image and a two-dimensional image.

17. The three-dimensional image display apparatus according to claim 15, wherein the birefringent phase modulator is configured to change a three-dimensional image display and a two-dimensional image display by controlling the applied voltage according to a selection of a three-dimensional image and a two-dimensional image.

18. The three-dimensional image display apparatus according to claim 1, wherein the birefringent phase modulator has a liquid crystal layer which is driven by a matrix and a pair of electrodes and sandwich the liquid crystal layer, and configured to control a phase-axis partially by an applied voltage to the electrodes.

19. The three-dimensional image display apparatus according to claim 6, wherein the birefringent phase modulator has a liquid crystal layer which is driven by a matrix and a pair of electrodes and sandwich the liquid crystal layer, and configured to control a phase-axis partially by an applied voltage to the electrodes.

20. The three-dimensional image display apparatus according to claim 18, wherein the birefringent phase modulator configured to change a three-dimensional image display and a two-dimensional image display partially by controlling the applied voltage according to a selection of a three-dimensional image and a two-dimensional image.

21. The three-dimensional image display apparatus according to claim 18, wherein the birefringent phase modulator configured to change a three-dimensional image display and a two-dimensional image display partially by controlling the applied voltage according to a selection of a three-dimensional image and a two-dimensional image.

22. The three-dimensional image display apparatus according to claim 13, wherein the lens array configured to control the applied voltage of the lens array, when the two-dimensional image is selected by controlling the polarity of applied voltage of the birefringent phase modulator.